

1. Switch to be mounted on a design element in the passenger room of a motor vehicle, with
- 5 - a haptic element (1, 1', 1'') which has at least one mechanical operating element (11) for the switch, and
- electric and/or electronic switch elements (21, 21', 22, 22', 23, 24, 24') which are mounted on a flexible conductor (2, 2a, 2b),
- 10 wherein
- the haptic element (1, 1', 1'') acts on the switch elements (21, 21', 22, 22', 23, 24', 24') when the operating element (11) is actuated,
- the zone (20, 20') of the flexible conductor (2, 2a, 2b) supporting the switch elements (21, 21', 22, 22', 23, 24, 24') and an associated zone (11) of the haptic element (1, 1', 1'') are configured so that
- 15 the corresponding zones (11, 20, 20') can be positioned and fixed relative to each other whilst no permanent electrical conductive connection is
- 20 established between the flexible conductor (2, 2a, 2b) and the haptic element (1, 1', 1''),
- when positioning the zone (20, 20') of the flexible conductor (2, 2a, 2b) supporting the switch elements (21, 21', 22, 22', 23, 24, 24'), the switch elements (21, 21', 22, 22', 23, 24, 24') can be inserted into a socket (12, 120) of the haptic element (1, 1', 1'') which is provided with the operating element (11) so
- 25

page 158

that a base body (10) of the haptic element (1, 1', 1'') together with the operating element (11) receives the switch elements (21, 21', 22, 22', 23, 24, 24') as they are inserted,

5 and

- as the switch elements (21, 21', 22, 22', 23, 24, 24') are inserted into the socket (12, 120) the switch elements (21, 21', 22, 22', 23, 24, 24') enter into active connection with the operating element (11) so that a
10 switch signal is triggered during actuation of the operating element (11) by means of the switch elements (21, 21', 22, 22', 23, 24, 24').

PATENT CLAIMS

1 ~~Switch to be mounted on a design element in the~~
5 passenger compartment of a motor vehicle, with
- a haptic element which has at least one mechanical
operating element for the switch, and
- electric and/or electronic switch elements which are
mounted on a flexible conductor,
10 wherein the haptic element acts on the switch elements
when the operating element is actuated,

characterised in that

15 the zone (20) of the flexible conductor (2, 2a, 2b)
supporting the switch elements (21, 21', 22, 22', 23, 24,
24') and an associated zone (11) of the haptic element (1,
1', 1'') are configured so that the corresponding zones
(11, 20) can be positioned and fixed relative to each
20 other whilst no permanent electrical conductive connection
is established between the flexible conductor (2, 2a, 2b)
and the haptic element (1, 1', 1'').

2. Switch according to claim 1 **characterised in that** the
25 haptic element (1, 1', 1'') cannot be brought into
electrically conductive connection with the switch
elements (21, 21', 22, 22', 23, 24, 24').

3. Switch according to claim 1 or 2 **characterised in that**
30 the haptic element (1, 1', 1'') has no electrically
conductive component parts which can be coupled
electrically with the switch elements (21, 21', 22, 22',
23, 24, 24').

10069201.02200

4. Switch according to claim 1 **characterised in that** the haptic element (1, 1', 1'') can only be brought into electrically conductive connection with the switch elements (21, 21', 22, 22', 23, 24, 24') by actuating an operating element (11) of the haptic element (1, 1', 1'').

5. Switch according to claim 4 **characterised in that** the electrically conductive connection only exists for as long as the switch is located in the switching state established by actuating the operating element (11).

6. Switch according to claim 1, 4 or 5 **characterised in that** the haptic element (1, 1', 1'') has no electrical structural elements apart from an electrical conductor.

7. Switch according to claim 1, 4, 5 or 6 **characterised in that** the haptic element (1, 1', 1'') has as a single electrically conductive component which can be coupled electrically with the switch elements (21, 21', 22, 22', 23, 24, 24') a contact bridge with which an electrical connection can be established between two switch elements (21, 21', 22, 22', 23, 24, 24').

8. Switch according to one of the preceding claims, **characterised in that** the relevant zones (11, 20, 20') of the conductor (2, 2a, 2b) and the haptic element (1) are formed as mechanical plug connectors wherein a base body (10) of the haptic element (1) has a socket zone (12) with which the zone (20, 20') of the flexible conductor (2) supporting the switch elements (21, 21', 22, 22') can be brought into positive engagement.

9. Switch according to claim 8 **characterised in that** the zone of the flexible conductor (2) supporting the switch elements (21, 21', 22, 22', 23, 24, 24') has a mechanical reinforcement (121, 122, 123, 124).

10069201.022202

10. Switch according to claims 8 and 9 **characterised in that** the mechanical reinforcement is formed as a frame (124) around the edges, a plate (123, 125) at the back or a cast element (121, 122) which surrounds the relevant zone (20).

11. Switch according to one of the preceding claims **characterised in that** the mechanical reinforcement has at least one detent element (125b) for securing the insert position in respect of the haptic element and/or means (125a) for sealing the plug zone against damp.

12. Switch according to one of claims 1 to 7 **characterised in that** the relevant zones (11, 20') of the conductor (2) and haptic element (1', 1'') are formed as clamp-fit connections wherein a base body (10) of the haptic element (1', 1'') has a socket zone (120) and a fixing element (12', 12'') connectable therewith so that the zone (20') of the flexible conductor (2) supporting the switch elements (22, 22') can be clamped between the socket zone (120) of the haptic element and the fixing element (12', 12'').

13. Switch according to claim 12 **characterised in that** the fixing element (12') is connected in one piece with the base body (10) through a film hinge (12b) of a plastics base body (10) of the haptic element (1').

14. Switch according to claim 11 **characterised in that** the fixing element (12'') is formed as a separate clamping plate.

15. Switch according to claim 12 **characterised in that** means are provided for positioning the zone of the flexible conductor supporting the switch elements relative to the base body of the haptic element.

10069201.022202

16. Switch according to claim 15 **characterised in that** the positioning means are formed on the part of the flexible conductor (2) in the form of recesses (126) and on the part of the base member of the haptic element in the form of corresponding studs or the like.

17. Switch according to one of the preceding claims **characterised in that** the switch elements (22, 22') provided on the flexible conductor (2) are formed as electrical contact faces which are allocated an electrical contact bridge which is connected to an operating element (11) of the haptic element (1) and which when the operating element (11) is actuated closes the electrical circuit.

18. Switch according to one of the preceding claims **characterised in that** the switch elements (24, 24') provided on the flexible conductor (2) are provided in boxes, e.g. in the form of SMD switches or switch mats.

19. Switch according to one of the preceding claims **characterised in that** the switch elements provided on the flexible conductor (2) are designed as magneto-resistive structural elements (e.g. Hall elements) which are each allocated a permanent magnet which is connected to an actuating element of the haptic element.

20. Switch according to one of the preceding claims **characterised in that** the switch elements provided on the flexible conductor (2) are formed as inductive or capacitive close range approach switches.

21. Switch according to one of the preceding claims, **characterised in that** the switch elements provided on the flexible conductor (2) are formed as transponder readers.

22. Switch according to one of the preceding claims **characterised in that** the switch elements provided on the

10069201.022202

flexible conductor (2) are formed as passive or active optical elements allocated on the part of the operating elements of the haptic element means for reflection for the purpose of establishing a visual transmission path or
5 means for interrupting a visual transmission path.

23. Switch according to one of the preceding claims characterised in that further structural elements (3a, 3b) such as for example an optical element for illuminating
10 the switch, a micro controller, resistances, diodes or the like, are mounted on the zone (20) of the flexible conductor (2) supporting the switch elements.

24. Switch according to one of the preceding claims characterised in that the zone (20) supporting the switch elements is detachably connected to the haptic element (1, 1', 1'').
15

25. Switch according to one of the preceding claims characterised in that the switch has in addition to the switch elements (21, 21', 22, 22', 23, 24, 24') also further electrical and/or electronic structural elements.
20

26. Switch according to one of the preceding claims characterised in that the zone (11) of the haptic element (1, 1', 1'') associated with the switch elements (21, 21', 22, 22', 23, 24, 24') forms at the same time at least one operating element of the haptic element (1, 1', 1'').
25

10069201.022002